06-09-00

A/REISSUE

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PTO/SB/50 (4/98)
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REISSUE PATENT APPLICATION TRANSMITTAL

Address to:

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Box Patent Application
Washington, DC 20231

Attorney Docket No.	1166/61926
First Named Inventor	Carl-Eric Ohlson
Original Patent Number	5,764,724
Original Patent Issue Date (Month/Day/Year)	June 9, 1998
Express Mail Label No.	EL628789988US

APPLICATION FOR REISSUE OF: (check applicable box) [X] Utility Patent [ ] Design Patent [ ] Plant Patent

APPLICATION ELEMENTS

1. [X] * Fee Transmittal Form *(PTO/SB/56)* *(Submit an original, and a duplicate for fee processing)*
2. [X] Specification and Claims *(amended, if appropriate)*
3. [X] Drawing(s) *(proposed amendments, if appropriate)*
4. [X] Reissue Oath / Declaration (original or copy) *(37 C.F.R. § 1.175)(PTO/SB/51 or 52)*
5. Original U.S. Patent
   - [X] Offer to Surrender Original Patent *(37 C.F.R. § 1.178)(PTO/SB/53 or PTO/SB/54)*
   - *or*
   - [ ] Ribboned Original Patent Grant
   - [ ] Affidavit / Declaration of Loss *(PTO/SB/55)*
6. Original U.S. Patent currently assigned?
   - [X] Yes [ ] No

(If Yes, check applicable box(es))

- [X] Written Consent of all Assignees *(PTO/SB/53 or 54)*
- [X] 37 C.F.R. § 3.73(b) Statement [X] Power of Attorney

ACCOMPANYING APPLICATION PARTS

7. [X] Foreign Priority Claim *(35 U.S.C. 119)* *(if applicable)*
8. [X] Information Disclosure Statement (IDS)/PTO-1449 [X] Copies of IDS Citations
9. [ ] English Translation of Reissue Oath/Declaration *(if applicable)*
10. [ ] * Small Entity Statement(s) [ ] Statement filed in prior application, Status still proper and desired *(PTO/SB/09-12)*
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard *(MPEP 503)* *(Should be specifically itemized)*
13. [X] Other: Assignment to Hologic, Inc., Recordation cover sheet form PTO-1595 and a check for the $40 recordation fee.

NOTE FOR ITEMS 1 & 10: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

14. CORRESPONDENCE ADDRESS

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NAME (Print/Type)	Ivan S. Kavrukov	Registration No. (Attorney/Agent)	25,161
Signature		Date	June 8, 2000

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REISSUE APPLICATION FEE TRANSMITTAL FORM

Docket Number (Optional): 1166/61926

Claims as Filed - Part 1

Claims in Patent	For	Number Filed in Reissue Application	(3) Number Extra	Small Entity Rate	Small Entity Fee		Other than a Small Entity Rate	Other than a Small Entity Fee
(A) 19	Total Claims (37 CFR 1.16(j))	(B) 80	**** 60 =	x $___ =		or	x $ 18 =	1,080
(C) 2	Independent Claims (37 CFR 1.16(i))	(D) 16	* 13 =	x $___ =			x $ 78 =	1,014
			Basic Fee (37 CFR 1.16(h))		$___			$ 690
			Total Filing Fee		$		OR	$ 2,784

Claims as Amended - Part 2

	(1) Claims Remaining After Amendment		(2) Highest Number Previously Paid For	(3) Extra Claims Present	Small Entity Rate	Small Entity Fee		Other than a Small Entity Rate	Other than a Small Entity Fee
Total Claims (37 CFR 1.16(j))	***	MINUS	**	* =	x $___ =		or	x $___ =	
Independent Claims (37 CFR 1.16(i))	***	MINUS	*****	=	x $___ =			x $___ =	
				Total Additional Fee		$		OR	$

* If the entry in (D) is less than the entry in (C), Write "0" in column 3.
** If the "Highest Number of Total Claims Previously Paid For" is less than 20, Write "20" in this space.
*** After any cancelation of claims
**** If "A" is greater than 20, use (B -A); if "A" is 20 or less, use (B - 20).
***** "Highest Number of Independent Claims Previously Paid For" or Number of Independent Claims in Patent (C).

☐ Please charge Deposit Account No. _____ in the amount of _____.
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☒ The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 or 1.17 which may be required, or credit any overpayment to Deposit Account No. 03-3125.
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☒ A check in the amount of $ 2,784.00 to cover the filing / additional fee is enclosed.

June 8, 2000
Date

Ivan S. Kavrukov
Signature of Applicant, Attorney or Agent of Record

Ivan S. Kavrukov, Reg. NO. 25,161
Typed or printed name

Dkt. 1166/61926

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Reissue Application Of:	Carl-Eric Ohlson
For:	METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSORING, SUCH AS ELECTRONIC IMAGE STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE
Reissue Application No.:	
Reissue Application Filing Date:	Concurrently herewith
Original Patent No.:	5,764,724
Original Patent Granted On:	June 9, 1998

1185 Avenue of the Americas
New York, New York 10036

Assistant Commissioner for Patents
Washington, D.C. 20231
Sir:

CONSENT OF ASSIGNEE HOLOGIC, INC. TO REISSUE APPLICATION AND OFFER TO SURRENDER ORIGINAL PATENT

Hologic, Inc., the assignee of the subject patent (by virtue of an assignment signed on April 19, 2000 and submitted herewith for recordal), through its authorized undersigned officer, hereby consents to the filing, examination, and issuance of the above-identified application seeking reissue of U.S. Patent No. 5,764,724 granted on June 9, 1998, and offers to surrender the original patent before the grant of a reissue patent.

HOLOGIC, INC.

Date: June 7, 2000

(Signature)

GLENN P MUIR
(Name)

VICE PRESIDENT & TREASURER
(Title)
Authorized to sign on behalf of
Hologic, Inc.

PTO/SB/96 (6-98)
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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Hologic, Inc.

Application No./Patent No.: 5,764,724 Filed/Issue Date: June 9, 1998

Entitled: METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSORING, SUCH AS ELECTRONIC IMAGE STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE

Hologic, Inc. (Name of Assignee), a Corporation (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [X] the assignee of the entire right, title, and interest; or

2. [ ] an assignee of an undivided part interest

in the patent application/patent identified above by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. [X] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: Carl-Eric Ohlson To: AO Medical Products AB
   The document was recorded in the Patent and Trademark Office at
   Reel 8532, Frame 0094, or for which a copy thereof is attached.

2. From: AO Medical Products AB To: Hologic, Inc.
   The document is submitted to the Patent and Trademark Office for recordal concurrently herewith.

3. From: _____ To: _____
   The document was recorded in the Patent and Trademark Office at
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[ ] Additional documents in the chain of title are listed on a supplemental sheet.

[X] Copies of assignments or other documents in the chain of title are attached.

[**NOTE**: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the PTO. See MPEP 302-302.8]

The undersigned (whose title is supplied below) is empowered to sign this statement on behalf of the assignee.

June 7, 2000
Date

Signature

GLENN P. MUIR
Typed or printed name

VICE PRESIDENT + TREASURER
Title

REISSUE
Application
for
United States Letters Patent

To all whom it may concern:

Be it known that I, Carl-Eric Ohlson

have invented certain new and useful improvements in

METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSORING, SUCH AS ELECTRONIC IMAGE STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE

of which the following is a full, clear and exact description:

METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSORING, SUCH AS ELECTRONIC IMAGE STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE

TECHNICAL FIELD

The present invention relates to a method of imaging a person or an object in at least two directions by X-ray photography, while using an X-ray cassette as a receptor or other forms of radiation-absorbing techniques with the aid of a radiation receptor, for instance for electronic image storage.

In imaging processes of this kind, there is used a radiation source which is supported for movement in X-, Y- and Z-directions and which is rotatable about a horizontal axis. The receptor unit may be mounted in or positioned beneath a patient table and is movable in the X-direction. Movement of the radiation source may be initiated automatically, as the receptor unit is moved.

By X-direction is meant here and in the following a direction of movement which is parallel with one long side of the patient table, while by Y-direction is meant a direction of movement perpendicular to the extension of said long side, i.e. a direction of movement parallel with the short sides of the table. By Z-direction is meant movement in a vertical direction. This enables the patient table to be brought to different positions in relation to a tower column or a ceiling-mounted tower which carries the beam source.

The present invention also relates to a patient table equipped with a receptor unit, and more specifically to a patient table of the kind defined in the preamble of claim 5.

BACKGROUND PRIOR ART

GB-B-1.323.769 (Picker Corp.) describes apparatus comprising a receptor part disposed in a patient support table, and an overlying ceiling-mounted beam source. The apparatus enables side-on photographs to be taken with a horizontal beam path, by swinging-up the patient's support table about a horizontal axis and pivoting the beam source. The apparatus also enables the image size and the shutter setting to be varied in relation to the beam-source/receptor distance ("SID", i.e. "source-image-distance". However, movement of the beam source and swinging of the patient support table must be effected manually, which is experienced as troublesome by the radiologists concerned.

EP-A-0 430 934 (AO Medical Products) describes a method of the aforesaid kind in which activation of a secondary receptor pivotally associated with the receptor unit or mountable thereon and extending in a vertical plane results, optionally after a time delay, in automatic movement of the beam source to a basic setting for horizontal, centered beam path onto the secondary receptor.

A Philips brochure describes a patient support table which carries a receptor unit for a vertical beam path. This receptor unit can be swung outwards and upwards from one side of the table, to a position for receiving a horizontal beam path.

This latter arrangement, which is considered to represent the nearest prior art, has a number of drawbacks. When the receptor unit is to be swung out and up to receive a horizontal beam path, it is necessary for personnel who need to stand on the other side of the table in order to manoeuver

the beam source to move around the table to swing the receptor unit outwards and upwards, and then move back around the table and place themselves in their original position in which the beam source can be manoeuvered. This procedure is experienced by the personnel as being both troublesome and time-consuming. The described solution also has other drawbacks from an ergometric aspect.

Another drawback is that the receptor unit is not centred in relation to the beam path when swung outwards and upwards from the table, and it is therefore necessary to move the beam source in the X-direction when adjusting for horizontal beam path.

Furthermore, this known arrangement only allows an exposure to be taken from one side of the patient. It is often difficult to "turn" the patient, particularly when the patient is seriously injured.

The effect of these drawbacks may sometimes be so serious as to impair the clarity of the pictures to an extent such as to require the X-ray to be taken again, therewith exposing the patient to an unnecessarily high radiation dosage.

THE OBJECTS OF THE INVENTION

One object of the invention is to provide a method and a patient support table of the aforedefined kind which, with one and the same receptor equipment, enables pictures to be taken with a vertical beam path, for instance with the patient lying down, and also with a horizontal beam path from each side of the patient support table, and preferably without changing the setting of the beam source in the X-direction, i.e. without moving the beam source laterally.

Another object is to provide equipment of the aforesaid kind which is superior to earlier known equipment with regard to ergometrics.

A further object of the invention is to provide equipment which can be adapted readily to different specific parameters, such as receptor size, table width, etc.

BRIEF DESCRIPTION OF THE INVENTION

These and other objects are fulfilled with a method of the kind defined in the preamble of claim 1 and having the features set forth in the characterizing clause of said Claim.

The invention enables the beam to be kept central in the Y-direction in the transition between a vertical and a horizontal beam path, irrespective of the alignment of the horizontal beam path in the Y-direction. In addition, the invention enables a receptor that has been swung up to a position above the table to be moved towards the patient and therewith obtain optimum picture sharpness and therewith a clearer diagnosis from the picture or image obtained.

The invention also enables the positions of pivot centres to be determined accurately in accordance with the different parameters that apply in individual cases, for instance in accordance with the dimensions of the receptor unit, the width of the patient support table, the desire for the bottom edge of the receptor to be located at a given height above the table when the receptor is in an outwardly swung position, and so on.

The present invention also enables the introduction of mutually dependent locking facilities with a crosswise function for outward swinging of the receptor unit in the horizontal plane. The effect afforded by the invention can be likened to the hinge of a hinged door, i.e. the receptor can present alternative pivot centres in dependence on the direction in which the receptor unit is swung outwards. Left and right pivot centres can be readily adapted to occurrent types of tables.

In practice, it is preferred that respective pivot centres are so placed in the X- and Y-directions that centering of the beam source in the X-direction will be the same for both a horizontal and a vertical beam path. A preferred method according to the invention is characterized by swinging the receptor unit in one or both of the alternative outwardly and upwardly swung positions to a position in which the unit is perpendicular to the longitudinal axis of the table, therewith enabling X-ray pictures to be taken of a patient seated in a wheelchair, for instance.

This enables the requirement of a separate frame or stand for taking such pictures to be dispensed with. This special outwardly swung position of the receptor unit may also be used in other circumstances, for instance when taking lung X-rays, etc.

In one preferred method of applying the invention, the receptor unit is movable in the X-direction along the longitudinal axis of the table with corresponding automatic movement of the beam source and resetting of said source for a horizontal beam path towards the receptor unit, after having swung the receptor unit outwardly and upwardly beyond a side edge of the table.

Thus, in the case of this preferred method of application, the beam source is adjusted automatically to the position adopted by the receptor unit.

In accordance with one method of application, the receptor unit is supported by a carriage which can move in the X-direction relative to the table and which can also be moved in the Y-direction relative to the carriage. The unit is carried by arms whose lengths can be adjusted and which supports the unit stably and reliably.

In this method of application, the receptor unit can be dropped down or raised up from an outwardly swung horizontal position on each side of the table, to a respective vertical position beneath or above the table, by pivotal movement about mutually parallel axles located at different levels.

When in an outwardly swung and upwardly lifted vertical position, the receptor unit can be swung about a central, vertical axle for work with an angled beam path.

According to another aspect, the invention also relates to a patient support table provided with a receptor unit and intended for X-ray photography or X-ray exposure or some other type of beam sensing, e.g. electronic image storage, said patient support table being characterized essentially by the features set forth in the following claims 8–16.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in more detail with reference to exemplifying embodiments thereof and also with reference to the accompanying drawings, in which

FIG. 1 is a perspective view of a receptor unit which can be swung outwardly and upwardly in different directions in accordance with the invention and which is mounted on a patient support table shown in chain lines;

FIG. 2 is a perspective view of the patient support table shown in FIG. 1 with the receptor unit in an outwardly and upwardly swung position, referenced C, to the right of the patient table, wherein the Figure also shows a number of possible alternative positions of the receptor unit, referenced B, D, E, F and G respectively, wherein the initial position shown in FIG. 1 is referenced A;

FIGS. 3–9 show the patient support table from above with respective receptor units in the aforesaid different positions, wherein FIG. 3 corresponds to positions A, FIG. 4 corre-

sponds to position B, FIG. 5 corresponds to position C, FIG. 6 corresponds to position D, FIG. 7 corresponds to position E, FIG. 8 corresponds to position F and FIG. 9 corresponds to position G;

FIG. 10 is a view of the patient support table shown in the other Figures from above, with the receptor unit shown in positions A and B, wherein the Figure also shows a number of reference signs relating to different relevant measurements and distances regarding the patient support table and the receptor unit respectively as explained in more detail below, and wherein the figure thus illustrates the geometric relationship between occurrent magnitudes;

FIG. 11 is a side view illustrating different receptor positions;

FIG. 12 is a simplified principle perspective view of a modified design of the patient support table, in which the receptor unit is accommodated in a carriage which can be moved along the table in the X-direction and is so mounted in the carriage as to be also movable in the Y-direction;

FIG. 13 is a perspective exploded view illustrating some of the elements by means of which the receptor unit is supported by the carriage for movement in the Y-direction;

FIG. 14 is a perspective view of the table and the carriage-supported receptor unit in a position in which the unit lies partially outside the table, i.e. prior to swinging the receptor unit outwards;

FIG. 15 is a perspective view corresponding to the view of FIG. 14 and shows the receptor unit swung out away from the table;

FIG. 16 is a perspective view corresponding to the view of FIG. 15 but showing the receptor unit swung to a vertical position;

FIG. 17 is a perspective view of the arrangement shown in FIGS. 12–16, wherein the receptor unit has been swung down to a vertical position about an axle which is parallel with the axle used to swing-up the unit, this downwardly swung position being used, for instance, to take X-rays of the knees of a seated patient;

FIG. 18 is a perspective view of parts of those elements which function in the linear and pivotal movements of the receptor unit;

FIG. 19 is a perspective view showing that the receptor unit can be swung about a vertical axle relative to its carrying means, so as to enable pictures to be taken with an angled beam path; and

FIG. 20 is a perspective principle view illustrating some of those positions to which the receptor unit can be adjusted by means of the carrying and journalling arrangement shown in FIGS. 12–19.

DESCRIPTION OF PREFERRED EMBODIMENTS

The reference numeral 1 used in the various Figures identifies a patient support table for use in X-ray photography or in some other type of beam sensing, such as electronic image storage, for instance. The patient support table is supported on telescopic legs 1*a* provided with floor plates 1*b*, which enable the table to be adjusted vertically.

The table includes a recess or aperture 5 for the accommodation of a receptor unit, generally referenced 2. The receptor unit can be moved in the X-direction, i.e. in the longitudinal direction of the table. Some of the FIGS. 3–9 show an X-axle in the centre of the table. To this end, the receptor unit may be mounted on a carriage or like device (not shown) mounted in the table.

The receptor unit **2** is intended for coaction with a beam source (not shown) which can be moved in the X-direction, the Y-direction, i.e. transversely to the long axis of the table, and in the Z-direction, i.e. in a vertical direction. The beam source can also be swung about a horizontal axle.

The receptor unit **2** is supported by arms **7**, **9** which are joined together via a link **8** and which coact with pivot centres **11**, **12** having vertical pivot axles located in the region of each side edge of the table, such as to enable the receptor unit to be swung out to alternative positions on each side of the table. The arm **9** is connected to the receptor unit **2** by means of a horizontal hinge **10**. The receptor unit **2** can thus be swung out from the initial position A shown in FIG. **1** to the position B shown in FIG. **2**, this latter position also being shown in FIG. **4**.

The receptor unit shown in FIGS. **3–9** correspond to the receptor unit shown in FIGS. **1** and **2**, with the exception that the units shown in FIGS. **3–9** have a handgrip **2***a* which enables the receptor unit to be swung manually. The receptor units are also provided with an operating panel **2***b* having push buttons by means of which different receptor locking and receptor release operations can be initiated, the beam source activated, etc.

The receptor can be swung up about the horizontal hinge **9** from the position B shown in FIG. **4** to the position C shown in full lines in FIGS. **2** and **5**.

The vertical axle **11** enables the receptor unit to be swung from position C to a position D, shown in FIG. **6**, in which the receptor unit is at right angles to the table **1**. With the receptor unit in position D, side-on pictures and front-on pictures can be taken of a patient seated in a wheelchair, for instance.

In FIG. **7**, the receptor unit **2** has been swung from the initial position shown in FIGS. **1** and **3** in the other direction, about the vertical axle **12**, to the position E in which the receptor unit is located slightly outside the opposing side edge of the table. It will be seen that in this position the receptor unit is also centered in the X-direction, i.e. there is no need to move the beam source laterally.

The receptor unit can be swung up from the position E shown in FIG. **7** to the position F shown in FIG. **8**.

FIG. **9** illustrates the receptor unit swung from position F to position G, this position corresponding to the position D on the other side of the table.

The various Figures illustrate that when applying the inventive method, the beam can be kept centered in the X-direction in the transition between the vertical beam direction and the two horizontal beam directions, in accordance with the position shown in FIGS. **1** and **2** and in FIGS. **7** and **8** respectively. At the same time, the positions of the

two pivot centres **11** and **12** can be determined as desired, in a manner described in more detail below.

The pivot axle about which the receptor unit is swung up is placed so that when the unit is in an upwardly swung position, the bottom edge of the unit will be located roughly in the plane of the table top or above the table top, for instance at a distance of 20 mm therefrom.

One advantage is that the operating unit *2a, 2b* is located on the same side of the table as the radiologist or his/her assistant, therewith facilitating operation.

FIGS. **10** and **11** illustrate different conceivable component measurements and the distances therebetween. The measurements also correspond to a left-hung receptor unit. In the initial position of the receptor unit

a) is the width of the receptor unit in the X-direction;

b) is the length of the unit in the Y-direction;

c) is the distance between the two pivot centres **11** and **12**;

d) is the width of the table;

e) is the distance in the Y-direction between the receptor unit and the pivot centre **11**;

f) is the distance between one side edge of the table and the pivot centre **12**;

g) is the distance in the Y-direction between the opposite side edge of the table and one end edge of the receptor unit in position B;

h) is the distance between this last-mentioned side edge and the pivot centre **11**;

x) is the distance in the X-direction between the centre point of the receptor unit in position A and the pivot centres **11**, **12**;

y) is the distance in the Y-direction between the centre point of the receptor unit in position A and the pivot centres **11**, **12**; and

h) is a radius corresponding to the length of the link **8**.

The following relationships will thus apply:

$x=Y=z/2$

$e=(c-b)/2$

$f=(d-c)/2$

$g=(2\times c-a-d)/2$

$h=(c-a)/2$

Table 1 below lists measurements which can be applied and calculated with regard to a constructional design preferred in practice.

TABLE 1

Receptor width a	Receptor depth b	Variable Axle distance c	Table width d	Distance centre Receptor e	Variable Centre Receptor f	Receptor Plate g	Center Receptor h
479	580	590	700	20	55	1	56
564	580	590	700	20	55	−42	13
479	580	600	700	40	50	11	61
564	580	600	700	40	50	−32	18
479	580	610	700	60	45	21	66
564	580	610	700	60	45	−22	23

The Table shows the aforesaid relationships in one application example, in which c and f are variables.

FIGS. **12–19** show a modified design of the receptor unit **2**, to-wit a design in which the receptor unit is carried for movement in the Y-direction by an element **15** which may either be part of a carriage which can be moved in the

X-direction in relation to the Table 1 or form part of a stand or frame that is fixed in relation to the table.

In the case of the illustrated embodiment, the element **15** includes three rollers **16** which are carried for rotation on three horizontal axles **17** and which are disposed in an elongated slot **19** provided in a further element **18** and functioning to guide movement of the further element **18** in relation to the first-mentioned element **15**.

The further element [19] 18 is provided at one end with a bearing block **19***a* which coacts with a corresponding bearing block **7***a* on a corresponding end of the arm **7**. The arm **7** of this embodiment is thus journalled more stably about the axle **12** than in the aforedescribed embodiments.

The other end of the arm **7** includes a bearing block **7***b* which coacts with a bearing element [8] 8a corresponding to the bearing element **7***a* on the arm **7**. this arrangement corresponding functionally to the link element **8** of the aforedescribed embodiments. The journal axle of this embodiment is referenced **11**, as in the former cases.

For the purpose of supporting the receptor unit **2**, the arm **9** is firmly secured with the aid of an intermediate element [6] 26 which is embraced by a U-shaped block 20 which is connected to the intermediate element **26** in a manner to allow the block **20** to pivot about the horizontal axle **10**. As will be seen from FIGS. **14–16**, the receptor unit carried by the carrier and guide arrangement **15–19** can be displaced in the Y-direction relative to the element **15** to the position shown in FIG. **15** in which the receptor unit **2** lies outside the confines of the Table **1**. The receptor unit can then be swung up to the vertical position shown in FIG. **16** about the axle **10**.

In FIG. **17**, the receptor unit **2** is shown to be swung down to a vertical position which defines an angle of 180° with the position shown in FIG. **16**. X-rays can be taken of the knees of a standing or sitting patient with the receptor unit in this position.

The receptor unit **2** is swung down around the axle **21**, which is parallel with the axle **10** but located on a lower level than said axle.

The intermediate element **26** supports the receptor unit **2** through the medium of a plate **24**. As will be seen from FIG. **16**, the plate **24** is pivotal about a vertical axle **25**. The receptor unit **2** accompanies the movement of plate **24** as it swings around the vertical axle **25**, therewith enabling the receptor unit to be moved to the position shown in FIG. **19**, for instance. In this position, the receptor unit is able to take pictures with an angled beam path.

FIG. **18** shows the elements **15–19** in an operative position, after having moved the receptor unit **2** in the Y-direction to the other side of the table **1** relative to the position shown in FIG. **17**, and after having swung the receptor unit **2** first to a horizontal position about the axle **21**, and thereafter to an upwardly swung, vertical position about the axle **10**.

When the receptor-unit support element **15** forms part of a carriage which can be moved in the X-direction, the receptor unit can be moved in the X-direction from the position shown in FIG. **18**. The beam source will normally accompany this movement of the receptor unit automatically. Movement of the unit in the X-direction and in the Y-direction can be achieved with the aid of appropriate motors (not shown).

As indicated in FIGS. **14–19**, the receptor unit **2** may include a unit **28** which carries a joy-stick **27** and which functions to facilitate movement of the receptor unit in different directions. Obviously, the unit **28** may be placed in some other position, for instance on one or both sides of the table or on a table-carried carriage (not shown).

FIG. 20 is a perspective view illustrating principly the different positions to which a receptor unit 2 can be moved in relation to a patient support table 1 when using the carrier and bearing mechanisms illustrated in FIGS. 12–19. Some of the positions shown by way of example in FIG. 20 correspond to the positions referenced A, C, F in FIGS. 1 and 2. However, FIG. 20 shows a number of further positions which have been made possible because the receptor unit can be moved in the X-direction and also possibly in the Y-direction, and because the receptor unit can also be swung down from a horizontal position and adjusted about a vertical axle for operating with an angle beam path.

Other modifications of the invention are possible within the scope of its basic concept as expressed in the following Claims. For instance, the receptor unit may be accommodated in a frame which carries a table top, for instance a "floating" table top, i.e. a table top that is movable in the X-direction and/or the Y-direction.

The trend towards the development of filmless systems in which images are produced and stored electronically is particularly well served by the inventive method and the inventive patient support table. Because of the complexity of such electronic systems and because of the cost of such systems in which the receptor is connected directly to an evaluating unit, it is of extreme importance that the receptor can be used universally, therewith avoiding loose film cassettes, for instance.

I claim:

1. A method relating to radiation sensing using a beam source which can be adjusted for at least one of horizontal, vertical and angled beam paths and a receptor unit (2) which can be swung out and up from a position beneath a top surface of a table to a vertical position on one side of and parallel with the table comprising the steps of:

(1) swinging the receptor unit (2) to at least one of two alternative positions outside each table side edge; and

(2) swinging the receptor unit (2) upwards to a vertical position about a horizontal axle (10);

wherein said receptor unit being swung through the medium of pivot centres (11, 12), has vertical axles in the region of each side edge of the table (1).

2. A method according to claim 1, further comprising the step of:

positioning respective pivot centres (11, 12) in an X-direction, which is parallel to a longitudinal direction of the table, and in a Y-direction, which is parallel to a transverse direction of the table,

wherein centering of the beam source in the X-direction will be the same with both horizontal and vertical beam paths.

3. A method according to claim 1, further comprising the step of:

swinging the receptor unit (2) outwardly to at least one of said alternative outwardly and upwardly swung positions to a position in which said unit is perpendicular to the X-direction.

4. A method according to claim 1, further comprising the step of:

(1) moving the receptor unit in a X-direction with corresponding, automatic movement of the beam source; and

(2) adjusting said source for horizontal beam path onto the receptor unit subsequent to having swung said unit outward and upward outside a side edge of the table.

5. A method according to claim 1, further comprising the step of:

supporting the receptor unit (2) with the aid of a support element (15) mounted on at least one of a frame

structure which is fixed relative to the table, and on a carriage which is movable in a X-direction in relation to said table,

wherein the receptor unit can be moved in the Y-direction relative to the element (15).

6. A method according to claim 5, further comprising the step of:

at least one of raising and lowering the receptor unit from an outwardly swung, horizontal position on one side of the table (1) to a vertical position at least one of above and beneath the table, by pivoting said receptor unit about mutually parallel axles (10; 21) located on mutually different levels.

7. A method according to claim 1, further comprising the step of:

pivoting the receptor unit (2) in an outwardly swung and upwardly swung vertical position about a central, vertical axle (22) for operating with an angled beam path.

8. A patient support table equipped with a receptor unit and intended for radiation sensing, wherein the receptor unit (2):

is supported for movement in a X-direction, which is parallel to the longitudinal direction of the table;

is adapted for coaction with a beam source which is movable in the X-direction, a Y-direction, which is parallel to the transverse direction of the table and in a Z-direction;

is capable of being swung about a horizontal axle; and

is capable of being swung out and up about a vertical and a horizontal axle from a position beneath a top surface of the table to a position on one side of and parallel with the table; and

is carried by arms (7, 9) which are joined together, by a link (8), through the medium of pivot centres (11, 12) having vertical axles in the region of each side edge of the table (1), to enable the receptor unit (2) to be swung out to alterative positions on each side of the table (1) and swung up to a position in which the receptor unit is parallel with the table for operating with a horizontal beam path, this latter movement of the receptor unit being possible by virtue of a horizontal hinge (10) which connects said unit to one (9) of said arms.

9. A table according to claim 8, wherein the receptor unit (2) can be swung from the position for operation with a horizontal beam path to a position perpendicular to the table, through the medium of a vertical axle.

10. A table according to claim 9, wherein the vertical axle constitutes one (11) of said pivot centres (11, 12).

11. A table according to claim 8, wherein the lengths of the arms (7, 9) and the link (8) allow the receptor unit (2) to take a position for operation with a centered beam path without being moved in the X-direction from its original position (position A) beneath a top surface of the table (1), irrespective of from which side the receptor unit is swung outwards and upwards.

12. A table according to claim 8, wherein the receptor unit (1) and its associated arms (7, 9), link (8) and pivot centres (11, 12) are supported by a carriage mounted on the underside of the table (1) and movable in the X-direction.

13. A table according to claim 8, wherein the table top is movable in at least one of the X-direction and the Y-direction, and the receptor unit (1) is mounted in a frame carried by said table top.

14. A table according to claim 12, wherein the carriage includes an element (15) having means (16–19) for guiding movement of a further element (18) journalled to one (7) of the arms (7, 9), wherein the other (9) of said arms carries a block (20) in which a plate (24) carrying the receptor unit (20) is journalled for pivotal movement about a horizontal axle (10).

15. A table according to claim 14, wherein the block (20) has a further axle (21) which is parallel with said horizontal axle (10) and on which the plate supporting said receiver receptor unit is pivotally mounted.

16. A table according to claim 15, wherein the receptor unit (2) is connected to the plate (24) by means of an axle (25) which extends perpendicularly to the plate and about which the receptor unit can be swung for operation with an angled beam path.

17. A table according to claim 8, wherein at least one of the table and the receptor unit includes an operating device, for manoeuvering the linear movement and pivotal movement of the receptor unit (2) in relation to the patient support table.

18. A table according to claim 12, wherein the carriage includes an operating device, for manoeuvering the linear movement and pivotal movement of the receptor unit (2) in relation to the patient support table.

19. A table according to claim 13, wherein the frame includes an operating device, for manoeuvering the linear movement and pivotal movement of the receptor unit (2) in relation to the patient support table.

20. An x-ray system electronically forming x-ray images, comprising:

a patient table having a top elongated in a head-feet direction and left and right sides;

an articulated structure supported at a selected position relative to the patient table for selective relative movement between at least portions of said articulated structure and the table top;

an x-ray receptor producing x-ray images electronically in response to receipt of x-rays;

said articulated structure supporting the x-ray receptor, but not an x-ray source, for selective movement to and maintenance of each of a position of the receptor under the patient table top for through-table imaging, a position of the receptor at the left side of the patient table, and a position of the receptor at the right side of the patient table;

wherein when in either of said positions at the left and at the right side of the patient table, the x-ray receptor is selectively in each of a position substantially along the patient table top and a position transverse to the patient table top;

wherein when in said position transverse to the patient table top, the x-ray receptor is selectively in each of a position generally above the patient table top and a position generally below the patient table top; and

wherein when in said position generally above the patient table top, the receptor is selectively in each of a position substantially parallel to the length of the patient table top, a position substantially normal to the length of the patient table top, and a position angled to the length of the patient table top.

21. A system as in claim 20 in which the articulated structure comprises a first arm, a second arm, a link between the first and second arms, said first arm being supported by the patient table and pivoting about a vertical axis, and said link pivoting relative to at least one of the arms about a vertical axis, and a horizontal hinge coupling the second arm and the x-ray receptor.

22. A system as in claim 20 in which said articulated structure comprises a carriage element supported for movement along the table top length.

23. A system as in claim 22 in which said articulated structure comprises a carriage element further supported for movement across the table top length.

24. A system as in claim 20 including a carriage supported for movement along the length of the table top, said carriage supporting a carriage element for movement across the length of the table top to thereby selectively move the x-ray receptor along and/or across the length of the table top.

25. A system as in claim 20 in which the x-ray receptor is substantially normal to the table top when in the position transverse to the table top.

26. A system as in claim 20 in which said x-ray receptor is substantially parallel to the table top when in said position for through-table imaging.

27. A system as in claim 20 in which the table supports the articulated structure.

28. A system as in claim 20 in which the table top supports the articulated structure.

29. A system as in claim 20 including a stand positioned at a selected location relative to the table and supporting the articulated structure

30. A system as in claim 20 including a source of x-rays movable between positions corresponding to at least some of said positions of the x-ray receptor to direct said x-rays thereto.

31. A system as in claim 20 including a frame carrying said table top as a floating table top movable in at least one of the directions along the length and across the length of the table top relative to the frame, said frame accommodating said x-ray receptor.

32. An x-ray system comprising:
a patient table having a top extending in a head-feet direction and left and right sides;
an x-ray source selectively producing a beam of x-rays;

an x-ray receptor producing x-ray images electronically in response to an impinging two-dimensional distribution of x-ray intensities within said beam of x-rays; and

an articulated structure supporting the x-ray receptor, but not the x-ray source, for selective movement relative to the patient table top between positions including each of a position under the patient table top for through-table x-ray imaging with the x-ray source above the table top, a position at the left side of the patient table and transverse to and generally above the patient table top for cross-table x-ray imaging with the x-ray source generally above and at the right side of the patient table, and a position at the right side and transverse to the patient table top for cross-table imaging with the x-ray source generally above and at the left side of the patient table;

wherein each of said positions of the x-ray receptor transverse to the patient table top and at the left and right sides of the patient table for cross-table x-ray imaging includes a position in which the x-ray receptor is selectively in a position substantially parallel to the length of the patient table top for cross-table lateral x-ray imaging and a position in which the x-ray receptor is angled to the length of the patient table for cross-table oblique x-ray imaging.

33. A system as in claim 32 in which the articulated structure is mounted for selective movement along the head-feet direction to move said positions of the x-ray receptor in said direction.

34. A system as in claim 33 in which the articulated structure includes an element supporting the x-ray receptor and mounted for selective left-right movement relative to the table top.

35. A system as in claim 32 in which said articulated structure further supports the x-ray receptor for selective movement to a position to the left and right side of and generally parallel to the table top for extremity imaging.

36. A system as in claim 35 in which when in said position to the left and right side of and generally parallel to the table top, the x-ray receptor is depressed relative to the table top.

37. A system as in claim 32 in which said articulated structure further supports the x-ray receptor for selective movement to a position to the left or right side of and transverse to the table top for chest imaging.

38. A system as in claim 32 in which the table supports the articulated structure.

39. A system as in claim 32 in which the table top supports the articulated structure.

40. A system as in claim 32 including a stand or frame supporting the articulated structure.

41. A system as in claim 32 in which said patient bed comprises a frame carrying said table top and accommodating said x-ray receptor, wherein said table top comprises a floating table top.

42. A system as in claim 41 in which the floating table top is mounted for selective movement along at least one of the head-feet direction and a left-right direction.

43. A system as in claim 42 in which said floating top is mounted for selective movement in each of said head-feet and left-right directions.

44. An x-ray system electronically forming x-ray images, comprising:
a patient table having a top with left and right sides;
an x-ray receptor for producing x-ray images electronically; and
an articulated structure supporting the x-ray receptor, but not an x-ray source, for selective relative movement between the table and the structure to selectively position the x-ray receptor at each of a position at the left side of the patient table for cross-table imaging of a patient on the table top and a position at the right side of the patient table for cross-table imaging from the left side of the patient, said movement taking place without moving the patient or the patient table to accomplish the movement;
said articulated structure having a portion remaining at a fixed position relative to the table top in the course of said movement.

45. A system as in claim 44, in which the articulated structure further supports the x-ray receptor for selective movement to a position at least at one of the left and right sides of the patient table for cross-table oblique imaging from the other one of the left and right sides of the table top.

46. A system as in claim 44 in which the x-ray receptor comprises an operating unit initiating receptor locking and release operations.

47. A system as in claim 46 in which said operating unit moves with the x-ray receptor between said positions of the receptor and is accessible to an operator from the side of the patient table top at which the receptor is positioned.

48. A system for positioning an x-ray receptor for diagnostic protocols comprising:

a filmless x-ray receptor producing x-ray images in response to x-rays impinging thereon;

an x-ray source emitting a beam of x-rays;

a patient table for supporting a patient between the source and receptor;

an articulated structure supporting the x-ray receptor, but not the x-ray source, for selective motion relative to the table to respective positions for a variety of x-ray protocols comprising at least a position for through-table imaging with the x-ray beam substantially vertical and the receptor under the table, and a position for cross-table lateral imaging with the x-ray beam being substantially horizontal and the receptor being selectively at the right side and the left side of the patient;

wherein said motion of the x-ray receptor maintains source-receptor centering at said positions and does not require moving the patient; and

wherein a portion of said articulated structure remains at a fixed position relative to the table during said motion.

49. A system as in claim 48 in which the table has a width in a left-right direction and a length, and the articulated structure supports the x-ray receptor for selective motion along the length and across the width of the table.

50. A system as in claim 49 including a handgrip for manually moving the x-ray receptor between said positions.

51. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having a length and a width; and

an articulated structure supporting the x-ray receptor, but not an x-ray source, for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a position for through-table imaging with the receptor under the table, a position for cross-table lateral imaging with the receptor at least at one side and generally above and along the length of the table, and a position for cross-table oblique imaging with the receptor at least at one side of the table and generally above and angled relative to the length of the table; and

supports for the table and articulated structure;

wherein at least a portion of the articulated structure remains at a fixed position relative to the patient table during said motion.

52. A system as in claim 51 in which said position for cross-table imaging includes a position for cross-table imaging at each side of the table.

53. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having a length and a width; and

an articulated structure supporting the x-ray receptor for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a position for through-table imaging with the receptor under the table, a position for cross-table imaging with the receptor at least at one side and generally above to the table and extending along a direction non-normal to the length of the table,

and a position for imaging of a seated patient or the knees of a standing patient with the receptor at least at one side of the table and generally below the table; and

supports for the table and articulated structure.

54. A system as in claim 53 in which said position for cross-table imaging comprises a position for cross-table lateral imaging with the receptor extending substantially along the length of the table.

55. A system as in claim 53 in which said position for cross-table imaging comprises a position for cross-table oblique imaging with the receptor extending at an angle to the length of the table.

56. A system as in claim 51 in which said position for cross-table imaging includes a position for cross-table imaging at each side of the table.

57. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having a length and a width; and

an articulated structure supporting the x-ray receptor, but not an x-ray source, for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a position for through-table imaging with the receptor under the table, a position for cross-table imaging with the receptor at least at one side and generally above the table and extending in a direction non-normal to the length of the table, and a position for imaging of a patient with the receptor at least at one side of the table and generally above the table and extending away from the table in a direction substantially normal to the length of the table; and

supports for the table and articulated structure.

58. A system as in claim 57 in which said non-normal direction is a direction extending along the length of the table.

59. A system as in claim 57 in which said non-normal direction extends at an angle to the length of the table.

60. A system as in claim 57 in which said position for cross-table imaging includes a position for cross-table imaging at each side of the table.

61. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having a length and a width; and

an articulated structure supporting the x-ray receptor, but not an x-ray source, for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a position for through-table imaging with the receptor under the table, a position with the receptor at least at one side and generally above to the table and extending away from the table, and a position with the receptor at least at one side of and generally below the table; and

supports for the table and articulated structure.

62. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having a length and sides spaced in a direction transverse to the table length; and

an articulated structure supported by the table and supporting the x-ray receptor for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a position for cross-table imaging with the receptor being selectively at each side of the table; and

a support for the table.

63. A system as in claim 62 in which said positions include a position for cross-table lateral imaging and a position for cross-table oblique imaging at each side of the table.

64. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having a length and sides spaced from each other in a width direction; and

an articulated structure supported by the table and supporting the x-ray receptor for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a first position for cross-table imaging with the receptor at least at one side of the table and extending in a direction non-normal to the length of the table, and a second position for imaging with the receptor at least at one side of the table and extending in a direction away from the table and normal to the length of the table; and

a support for the table;

wherein at least one of said first and second positions selectively includes a position at each side of the table.

65. A system as in claim 64 in which said non-normal direction is a direction extending along the length of the table.

66. A system as in claim 64 in which said non-normal direction extends at an angle to the length of the table.

67. A system as in claim 64 in which said position for cross-table imaging includes a position for cross-table imaging at each side of the table.

68. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having

a length and a width; and

an articulated structure supported by the table and supporting the x-ray receptor for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a position for cross-table imaging with the receptor at least at one side of and generally above the table and extending in a direction non-normal to the length of the table, and a position for imaging with the receptor at least at one side of the table and generally below the table; and

a support for the table.

69. A system as in claim 68 in which said non-normal direction is a direction extending along the length of the table.

70. A system as in claim 68 in which said non-normal direction extends at an angle to the length of the table.

71. A system as in claim 68 in which said position for cross-table imaging includes a position for cross-table imaging at each side of the table.

72. A system as in claim 68 in which said position with the receptor generally below the table comprises a position in which the receptor extends along the length of the table.

73. A system for positioning an x-ray receptor for diagnostic protocols comprising:

an x-ray receptor producing x-ray images electronically in response to x-rays impinging thereon;

a patient table for supporting a patient between the source and receptor, said table having a length and a width; and

an articulated structure supported by the table and supporting the x-ray receptor for selective motion relative to the table to respective positions for a plurality of x-ray protocols comprising at least a position with the receptor at least at one side and generally above to the table and extending away from the table in a direction normal to the length of the table, and a position for imaging with the receptor at least at one side of the table and generally below the table; and

a support for the table.

74. A system as in claim 73 in which said position with the receptor extending away from the table includes a position at each side of the table.

75. A system as in claim 73 in which said position with the receptor generally below the table comprises a position in which the receptor extends along the length of the table.

76. A method of x-ray imaging with a filmless x-ray receptor producing x-ray images electronically comprising:

providing an x-ray source selectively emitting a beam of x-rays, a filmless x-ray receptor for producing x-ray imaged electronically, and a patient table top for supporting a patient between the source and receptor;

moving the x-ray source and an articulated structure supporting the x-ray receptor, but not the source, between the following positions of the receptor and corresponding positions of the source in which the x-ray beam is directed at the receptor: a position under the table top for through-table imaging, a position at the left side of the table top, and a position at the right side of the table top;

wherein each of said positions at the left and at the right side of the patient table top includes a position in which the x-ray receptor is substantially along the patient table top and a position in which the x-ray receptor is transverse to the patient table top;

wherein when in said position transverse to the patient table top, the x-ray receptor is selectively in each of a position generally above the patient table top and a position generally below the patient table top; and

wherein when in said position generally above the patient table top, the receptor is selectively in each of a position substantially parallel to the length of the patient table top, a position substantially normal to the length of the patient table top, and a position angled to the length of the patient table top.

77. A method of x-ray imaging with an x-ray receptor producing x-ray images electronically comprising:

providing an x-ray source selectively emitting a beam of x-rays, an x-ray receptor selectively producing x-ray imaged electronically, and a patient table top supporting a patient between the source and receptor;

moving the x-ray source and an articulated structure supporting the x-ray receptor, but not the source, between a position under the table top for through-table imaging in which the x-ray source is above the patient, a position at the left side of the table top in which the x-ray source is to the right of the patient, and a position at the right side of the table top in which the x-ray source is to the left of the patient;

wherein in each of said positions the x-ray source is centered on the receptor to direct the x-ray beam at the x-ray receptor for imaging the patient with x-rays.

78. A method as in claim 77 including moving the x-ray source between positions corresponding to said positions of the x-ray receptor while maintaining the source centered on the receptor.

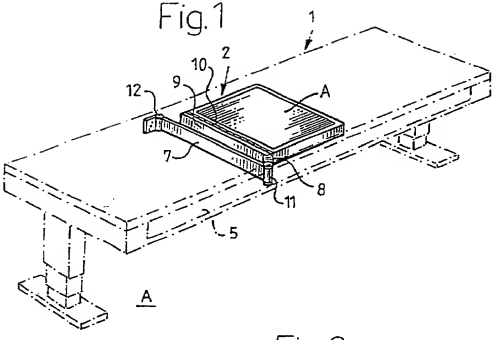
79. A method as in claim 77 in which said moving comprises moving the x-ray receptor along the length of the patient with corresponding automatic movement of the x-ray source.

80. A method as in claim 52 comprising manually moving the receptor between said positions thereof while said articulated structure supports the receptor.

[57] **ABSTRACT**

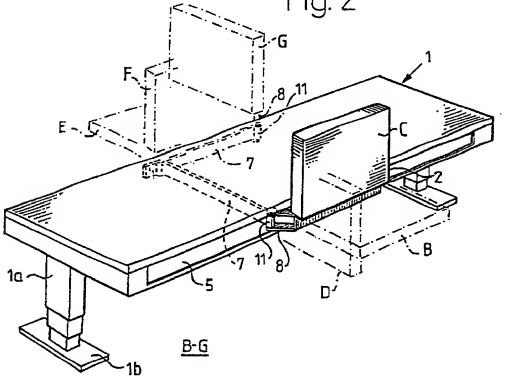
A method of X-ray photography or a method of some other type of radiation sensoring, such as electronic image storage, employs the use of a receptor unit (**2**) which can be swung outwards and upwards from an initial position in or beneath a patient support table (**1**) about alternative pivot centers (**11**, **12**) disposed in the region of respective side edges of the table to alternative positions for operating with a horizontal beam path. The receptor unit can be swung out about a vertical axis from these positions in which it is parallel with the longitudinal direction of the table to a position in which it is parallel with the longitudinal direction of the table to a position in which the unit is perpendicular to the longitudinal axis of the table, to enable pictures to be taken of a patient seated in a wheelchair, for instance. The invention also relates to a patient support table (**1**) provided with a receptor unit (**2**) of this kind.

Fig. 1



A

Fig. 2



B-G

Fig.3

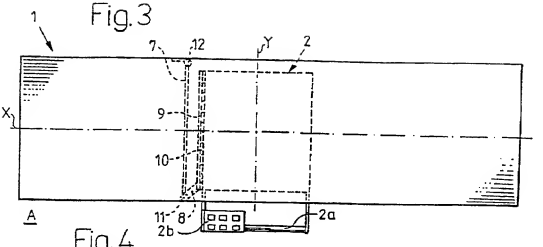


Fig.4

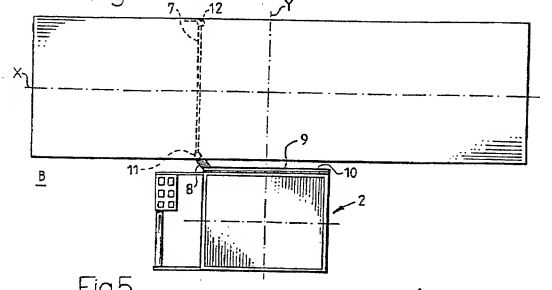


Fig.5

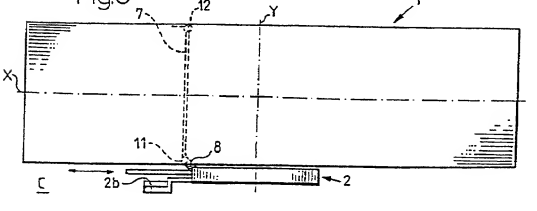


Fig. 6

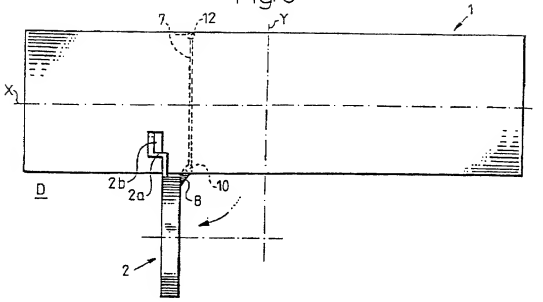


Fig. 7

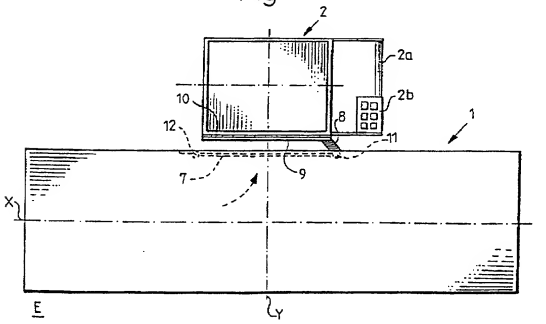


Fig. 8

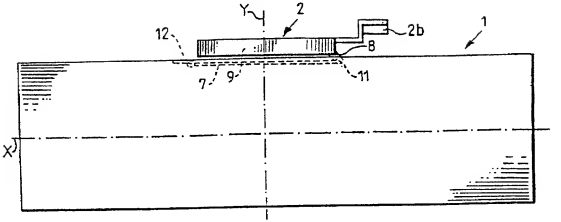


Fig. 9

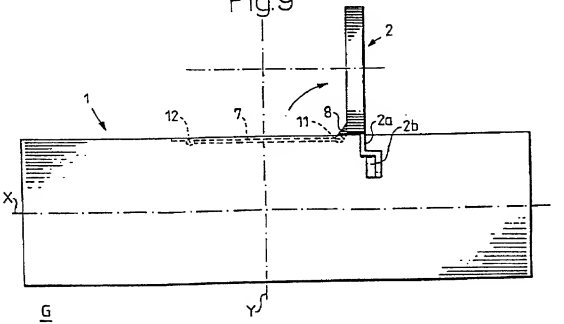


Fig. 10

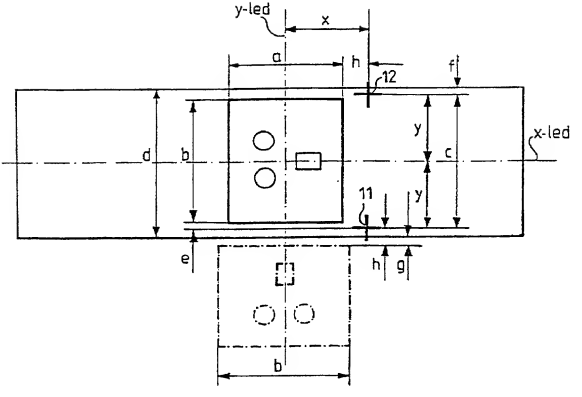


Fig. 11

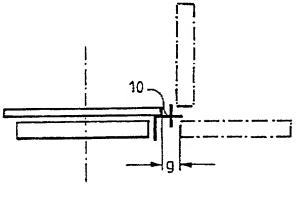


Fig.12

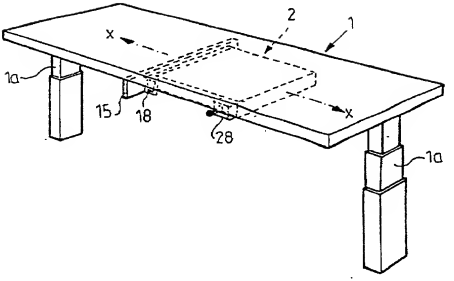


Fig.13

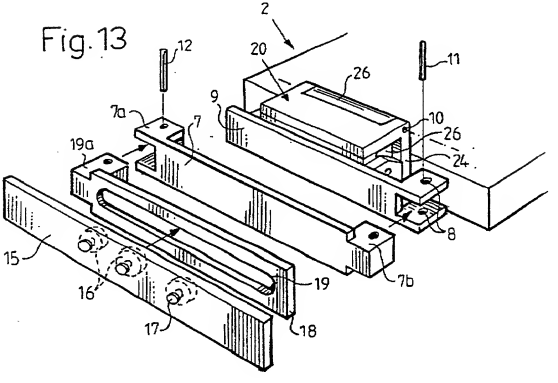


Fig.14

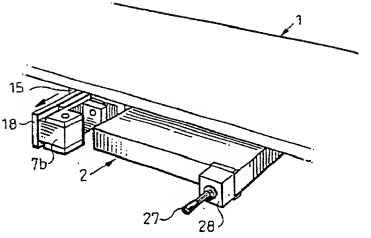


Fig.15

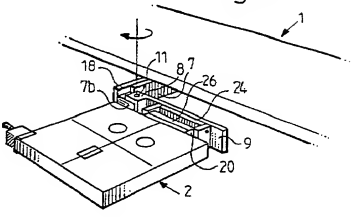


Fig.16

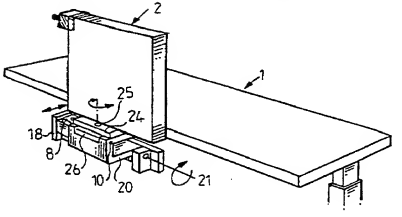


Fig.17

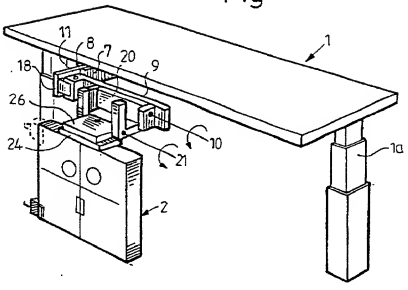


Fig.18

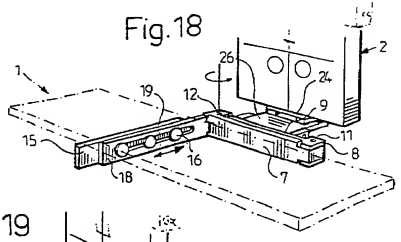


Fig.19

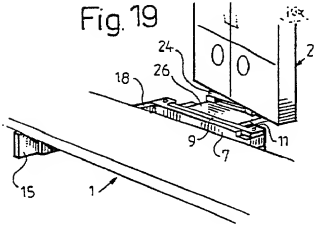
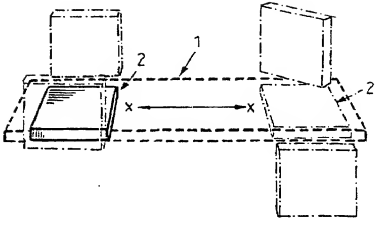


Fig. 20



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REISSUE APPLICATION DECLARATION BY THE INVENTOR

Docket Number (Optional)
1166/61926

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are stated below next to my name.
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is described and claimed in patent number 5,764,724, granted June 9, 1998, and for which a reissue patent is sought on the invention entitled METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSORING, SUCH AS ELECTRONIC IMAGE STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE, the specification of which

[X] is attached hereto.

[ ] was filed on _____ as reissue application number ___ / _____
and was amended on _____ .
(If applicable)

I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.
I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.
I verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

[ ] by reason of a defective specification or drawing.

[X] by reason of the patentee claiming more or less than he had the right to claim in the patent.

[ ] by reason of other errors.

At least one error upon which reissue is based is described as follows:

1. The inadvertent failure to include method claims such as proposed reissue claim 76 that does not recite "swinging" the receptor unit, or "vertical axles in the regions of each side edge of the table," as recited in the sole independent method claim 1 of the original patent; and

2. The inadvertent failure to include apparatus or system claims such as proposed reissue claim 20 that does not recite "arms" and "a link," as recited in the sole "patient support table" claim 8 of the original patent.

(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)

Docket Number (Optional) 1166/61926

All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant. As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Name(s)	Registration Number
Ivan S. Kavrukov	25,161
Richard F. Jaworski	33,515

Correspondence Address: Direct all communications about the application to:

☐ Customer Number ____ (Type Customer Number here) → *Place Customer Number Bar Code Label here*

OR

☒ Firm or Individual Name	Cooper & Dunham LLP
Address	1185 Avenue of the Americas
Address	
City	New York — State NY — ZIP 10036
Country	USA
Telephone	212-278-0400 — Fax 212-391-0525

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.

Full name of sole or first inventor (given name, family name)
Carl-Eric Ohlson

Inventor's signature: Carl-Eric Ohlson

Residence: Same as Post Office Address

Date: June 15, 2000

Post Office Address: ~~Ostermalmsgatan~~ 67, S-~~115~~ 11459 Stockholm, Sweden

Citizenship: Swedish

Full name of second joint inventor (given name, family name)

Inventor's signature | Date

Residence | Citizenship

Post Office Address

Full name of third joint inventor (given name, family name)

Inventor's signature | Date

Residence | Citizenship

Post Office Address

☐ Additional joint inventors are named on separately numbered sheets attached hereto.

Dkt. 1166/61926

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Reissue Application Of:	Carl-Eric Ohlson
For:	METHOD OF MAKING X-RAY PHOTOGRAPHS OR EXPOSURES OR OTHER TYPE OF RADIATION SENSORING, SUCH AS ELECTRONIC IMAGE STORAGE, AND A PATIENT TABLE HAVING A RECEPTOR UNIT FOR SUCH PHOTOGRAPHY, EXPOSURE OR IMAGE STORAGE
Reissue Application No.:	
Reissue Application Filing Date:	Concurrently herewith
Original Patent No.:	5,764,724
Original Patent Granted On:	June 9, 1998

1185 Avenue of the Americas
New York, N.Y. 10036

Assistant Commissioner for Patents
Washington, D.C. 20231

REVOCATION OF POWER OF ATTORNEY AND APPOINTMENT OF NEW ATTORNEYS

Sir:

The undersigned, as Assignee of the entire right, title, and interest in and to the above-identified patent and reissue patent application as evidenced by an Assignment submitted for recordal concurrently herewith, hereby revokes any and all prior Powers of Attorney and hereby appoints Ivan S. Kavrukov, Reg. No. 25161; Christopher C. Dunham, Reg. No. 22031; Norman H. Zivin, Reg. No. 25385; John P. White, Reg. No. 28678; Robert D. Katz; Peter J. Phillips (Reg. No. 29,691); and Richard F. Jaworski, Reg. No. 33515, and each of them, all c/o Cooper & Dunham LLP of 1185 Avenue of the Americas, New York, New York 10036 (Tel. 212-278-0400), as attorneys to prosecute said application and to transact all business in connection therewith.

Please address all communications, and direct all telephone calls, regarding this application to:

Ivan S. Kavrukov, Reg. No. 25161
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Hologic, Inc.

Date: JUNE 7, 2000

(Signature)

GLENN P. MUIR
(Name)

VICE PRESIDENT + TREASURER
(Title)